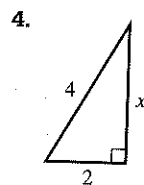
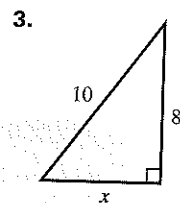
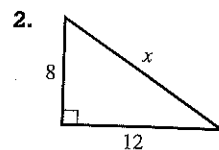
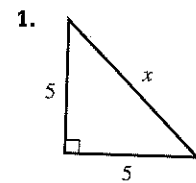


### QUICK REVIEW 4.2 (For help, go to Sections P.2 and 1.7.)

In Exercises 1–4, use the Pythagorean theorem to solve for  $x$ .



In Exercises 5 and 6, convert units.

5. 8.4 ft to inches

6. 940 ft to miles

In Exercises 7–10, solve the equation. State the correct unit.

7.  $0.388 = \frac{a}{20.4 \text{ km}}$

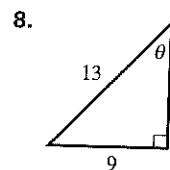
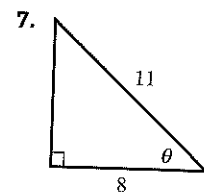
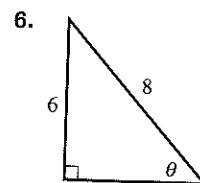
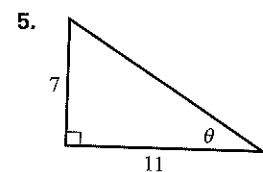
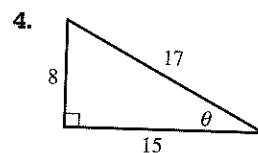
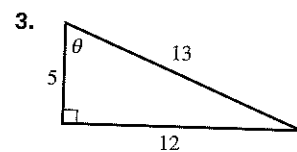
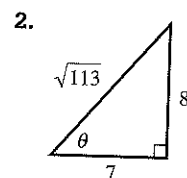
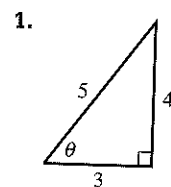
8.  $1.72 = \frac{23.9 \text{ ft}}{b}$

9.  $\frac{2.4 \text{ in.}}{31.6 \text{ in.}} = \frac{a}{13.3}$

10.  $\frac{5.9}{\beta} = \frac{8.66 \text{ cm}}{6.15 \text{ cm}}$

### SECTION 4.2 EXERCISES

In Exercises 1–8, find the values of all six trigonometric functions of the angle  $\theta$ .



In Exercises 9–18, assume that  $\theta$  is an acute angle in a right triangle satisfying the given conditions. Evaluate the remaining trigonometric functions.

9.  $\sin \theta = \frac{3}{7}$

10.  $\sin \theta = \frac{2}{3}$

11.  $\cos \theta = \frac{5}{11}$

12.  $\cos \theta = \frac{5}{8}$

13.  $\tan \theta = \frac{5}{9}$

14.  $\tan \theta = \frac{12}{13}$

15.  $\cot \theta = \frac{11}{3}$

16.  $\csc \theta = \frac{12}{5}$

17.  $\csc \theta = \frac{23}{9}$

18.  $\sec \theta = \frac{17}{5}$

In Exercises 19–24, evaluate *without* using a calculator.

19.  $\sin\left(\frac{\pi}{3}\right)$

20.  $\tan\left(\frac{\pi}{4}\right)$

21.  $\cot\left(\frac{\pi}{6}\right)$

22.  $\sec\left(\frac{\pi}{3}\right)$

23.  $\cos\left(\frac{\pi}{4}\right)$

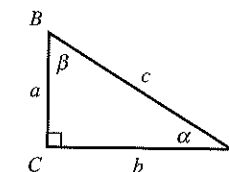
24.  $\csc\left(\frac{\pi}{3}\right)$

In Exercises 25–28, evaluate using a calculator. Give an exact value, not an approximate answer. (See Example 4.)

25.  $\sec 45^\circ$

26.  $\sin 60^\circ$

In Exercises 55–58, solve the right  $\triangle ABC$  for all of its unknown parts.



55.  $\alpha = 20^\circ$ ;  $a = 12.3$

56.  $\alpha = 41^\circ$ ;  $c = 10$

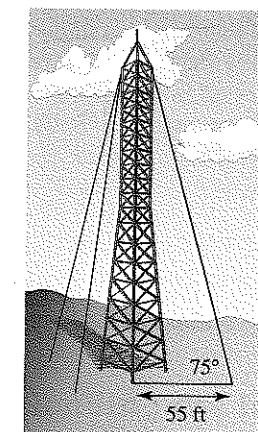
57.  $\beta = 55^\circ$ ;  $a = 15.58$

58.  $a = 5$ ;  $\beta = 59^\circ$

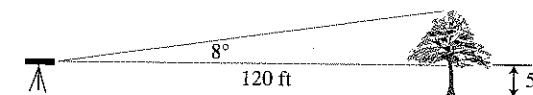
59. **Writing to Learn** What is  $\lim_{\theta \rightarrow 0} \sin \theta$ ? Explain your answer in terms of right triangles in which  $\theta$  gets smaller and smaller.

60. **Writing to Learn** What is  $\lim_{\theta \rightarrow 0} \cos \theta$ ? Explain your answer in terms of right triangles in which  $\theta$  gets smaller and smaller.

61. **Height** A guy wire from the top of the transmission tower at WJBC forms a  $75^\circ$  angle with the ground at a 55-foot distance from the base of the tower. How tall is the tower?



62. **Height** Kirsten places her surveyor's telescope on the top of a tripod 5 feet above the ground. She measures an  $8^\circ$  elevation above the horizontal to the top of a tree that is 120 feet away. How tall is the tree?



27.  $\csc\left(\frac{\pi}{3}\right)$

28.  $\tan\left(\frac{\pi}{3}\right)$

In Exercises 29–40, evaluate using a calculator. Be sure the calculator is in the correct mode. Give answers correct to three decimal places.

29.  $\sin 74^\circ$

30.  $\tan 8^\circ$

31.  $\cos 19^\circ 23'$

32.  $\tan 23^\circ 42'$

33.  $\tan\left(\frac{\pi}{12}\right)$

34.  $\sin\left(\frac{\pi}{15}\right)$

35.  $\sec 49^\circ$

36.  $\csc 19^\circ$

37.  $\cot 0.89$

38.  $\sec 1.24$

39.  $\cot\left(\frac{\pi}{8}\right)$

40.  $\csc\left(\frac{\pi}{10}\right)$

In Exercises 41–48, find the acute angle  $\theta$  that satisfies the given equation. Give  $\theta$  in both degrees and radians. You should do these problems without a calculator.

41.  $\sin \theta = \frac{1}{2}$

42.  $\sin \theta = \frac{\sqrt{3}}{2}$

43.  $\cot \theta = \frac{1}{\sqrt{3}}$

44.  $\cos \theta = \frac{\sqrt{2}}{2}$

45.  $\sec \theta = 2$

46.  $\cot \theta = 1$

47.  $\tan \theta = \frac{\sqrt{3}}{3}$

48.  $\cos \theta = \frac{\sqrt{3}}{2}$

In Exercises 49–54, solve for the variable shown.

